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journal or publication title	Bulletin of the Toyama Science Museum
number	7
page range	7- 22
year	1985- 03- 20
URL	http://repo.tsm.toyama.toyama.jp/?action=repository_uri&item_id=512

Morphological Accounts on Selected Chironomids Collected in Toyama*

Manabu SASA and Koichiro KAWAI
Toyama Medical & Pharmaceutical University

富山で採集したユスリカ類の形態の記載

佐々 学・河合幸一郎
富山医科薬科大学

これまで富山県下で採集したユスリカ類のうち、いわゆるユキユスリカとして冬期に出現した *Syndiamesa takatensis* TOKUNAGA の雄, 雌, *Diamesa tsutsuii* TOKUNAGA の雌, *Psilodiamesa nigatana* TOKUNAGA の雌, *Prodiamesa nagaii* n. sp. の雄, 雌, *Orthocladus supensus* TOKUNAGA, と *O. kanii* TOKUNAGA の雄, 雌, および, 秋に採集された *Tanytarsus konishii* n. sp. の雄についてその形態の記載をおこなった。

Among a large number of the chironomids collected from Toyama, morphological accounts are given with the following species which are new or only poorly described by previous workers. The methods for preparing the specimens and for making standard measurements have followed the previous reports by Sasa (1978-1984) published in NIES Research Reports. Nos. 3, 7, 13, 29, 43 and 70.

1. *Syndiamesa takatensis* TOKUNAGA, 1936

Syndiamesa (Syndiamesa) takatensis; TOKUNAGA, 1936, p.531

Syndiamesa (Syndiamesa) takatensis; TOKUNAGA, 1937, p.49

Materials studied: 10 males and 5 females were found among the chironomids caught with sucking tubes on the wall of university buildings in Sugitani, Toyama, and on the snow from January to end of March 1984. 6 males and a female were also identified among the specimens collected on the wall of buildings of a pharmaceutical company on the bank of Kumano River, Toyama (Specimen No. A 97: 01-10, 31-35, 55).

Male: Body length 5.66-7.04 (6.13 in average of 10) mm, wing length (measured by the distance between arcus (ar) and tip of wing, see Fig. 1-A) 4.03-4.59 (4.29) mm. Body entirely black with the exception of halteres which are brown apically, and the wing membrane which is slightly brown and milky. Eyes bare, each with a conspicuous dorsomedial projection, ER (ratio of the distance between the two eyes divided by height of an eye) 0.79-1.00 (mean 0.94). Palp with 4 flagellar segments, segment II distinctly produced beyond insertion of segment III (Fig. 1-B). Antenna with 13 flagellar segments, AR (ratio of the length of last segment to

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the combined length of the preceding flagellar segments) very high, 3.38-4.26 (mean 3.73). Supraorbital setae (so) 9-14 (mean 10.5) on one side, clypeal setae (cl) 10-18 (mean 12.0). Anteprenotum without dorsal setae and with 10-12 (mean 11.0) lateral setae on each side. Scutum without dorsomedian setae (dm), with 19-28 (mean 22.3) dorsolateral setae (dl), and with as many as 16-24 (mean 19.6) pre-alar setae (pa). Scutellar setae (sc) 45-64 (mean 59.5).

Wing in Fig. 1-A. Squama (sq) with 54-108 (mean 79.1) fringe hairs. Anal lobe (al) conspicuously produced. Costa extending beyond end of R4+5. Cross vein m-cu present, and situated distal to the fork of vein Cu (fCu). Anal vein (An) extending much beyond fCu. Front tibia (Fig. 1-C) with a long terminal spur (120 microns), middle tibia (Fig. 1-D) with two short terminal spurs (80 and 85 microns), hind tibia with a long terminal spur (90 microns), a short terminal spur (55 microns), and a terminal comb composed of 14 simple and free spurs 30-55 microns long (Figs. 1-E, F). Tarsus I and II of middle and hind legs each with two short terminal spurs (Fig. 1-G, H), other tarsal segments without terminal spur. Leg ratio (length of tarsus I divided by length of tibia) 0.79-0.85 (mean 0.83) for the front, 0.53-0.57 (mean 0.55) for the middle, and 0.65-0.70 (mean 0.67) for the hind leg. BR (Beard ratio, length of the longest hair on tarsus I divided by diameter of the segment at the position of the base of the hair) 5.0-7.7 (mean 6.4) for the front, 3.2-5.0 (mean 4.2) for the middle, and 4.3-6.4 (mean 5.2) for the hind leg. Tarsus V of front leg 0.11-0.13 (mean 0.12) times as long as front tibia. Tarsus IV of all legs cylindrical, and longer than tarsus V of the same leg. Empodium short, pulvilli absent, but claws are well developed, with long basal setae and apically forked (Fig. 1-I). Hind tibia with a row of numerous short spurs on apical 1/3 of the shaft.

Hypopygium in Fig. 1-J. Ninth tergite with several very long lateral setae, and 41-53 shorter setae on the posterior portion. Anal point absent, but ninth tergite with a simple or forked strong spur in the middle on or near posterior margin. Gonocoxite short and roughly triangular, without inner lobe. Gonostylus widest at about middle and narrowing towards apex, with a subapical swelling, a strong subapical spur, and several short spurs surrounding it (Figs. 1-K, L).

Female: Body length 4.85-6.38 (5.83 in average of 3) mm, wing length 4.29-4.90 (mean 4.54) mm. Body largely dark brown, slightly paler than in male in general; scutum and postnotum black, scutellum dark brown, abdominal tergites dark brown and with a narrow caudal pale band; all tibiae brown in the middle and paler than the two ends. Head in Fig. 1-M. Eyes reniform, not produced dorsomedially as in male, ER 1.09-1.12 (mean 1.11). Second flagellar segment of palp produced beyond insertion of the third segment as in male. Antenna composed of a pedicel and 6 flagellar segments, last segment with one subapical seta, AR 0.49-0.58 (mean 0.53). Supraorbital setae 12-14 (mean 13.0), clypeal setae 10-14 (mean 13.0). Anteprenotum without dorsal setae and with 8-18 (mean 13.7) lateral setae on each side. Scutum without dorsomedian, with 20-35 (mean 26.7) dorsolateral, and 20-27 (mean 22.8) pre-alar setae. Wing wider than in male but venation as in the male. Basal squama with 85-138

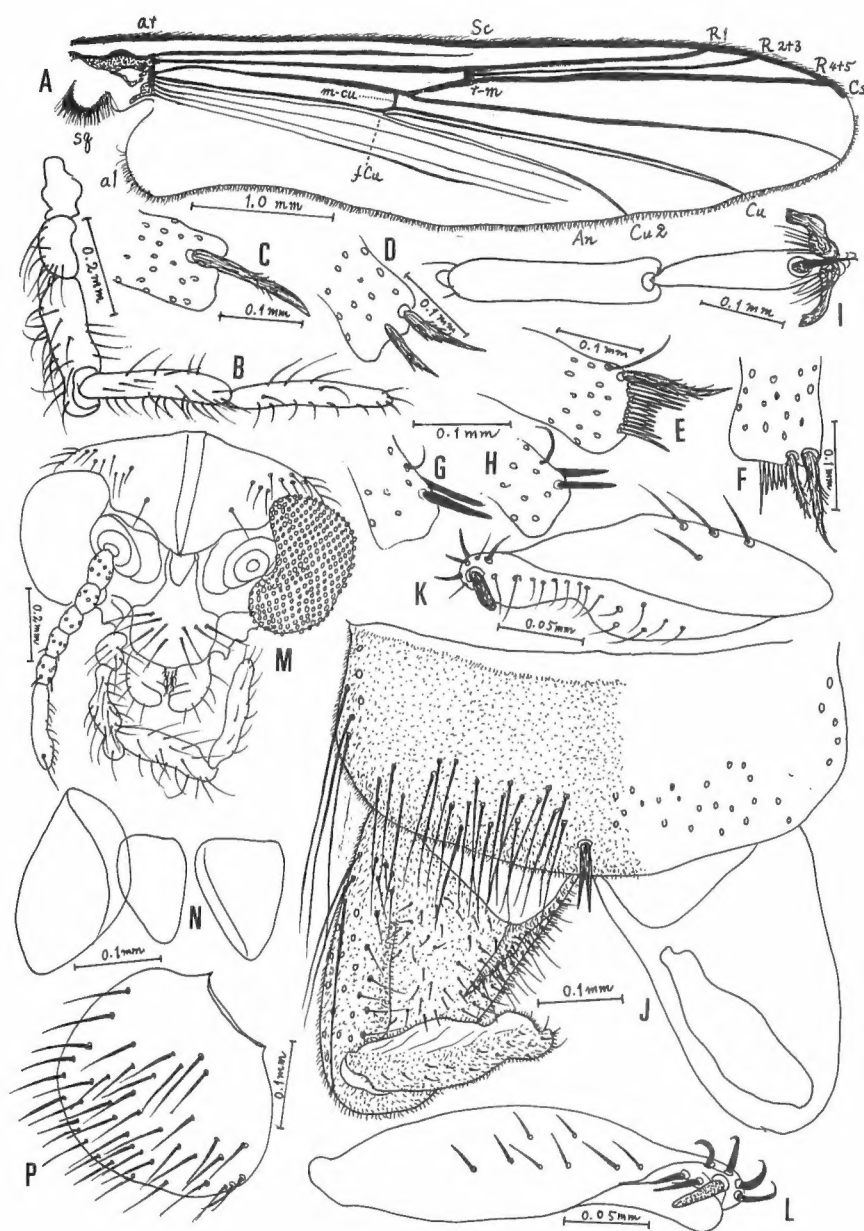


Fig. 1. *Syndiamesa takatensis* TOKUNAGA. Male. A. wing. B. palp, showing the second flagellar segment is produced beyond insertion of the third. C. tip of front tibia. D. tip of middle tibia. E, F. tip of hind tibia. G. tip of hind tarsus I. H. tip of hind tarsus II. I. front tarsus IV and V. J. hypopygium, dorsal view. K, L. gonostylus, dorsal view. Female. M. head. N. spermathecae. P. cercus.

(mean 109.7) fringe hairs, the second squama with 8-12 (mean 10.0) fringe hairs. LR1 0.70-0.75 (mean 0.73), LR2 0.47-0.48, LR3 0.59-0.61 (mean 0.60). BR1 2.5-2.7 (mean 2.6), BR2 2.2-2.8 (mean 2.5), BR3 2.8-3.3 (mean 3.0). Front tarsus V 0.13-0.14 times as long as front tibia. Distribution of terminal spurs as in male, tarsi I and II of all legs with two short spurs (may be only one in front tarsus I and II). Tarsi IV cylindrical and longer than tarsi V in all legs. Pulvilli absent. Cercus nearly circular, about 70 microns high and 76 microns wide (Fig. 1-P). Spermathecae 3, one is larger than the other two (Fig. 1-N), all dark brown in color.

Remarks: The above morphological characters of the male are almost coincident with that of *Syndiamesa takatensis* TOKUNAGA, 1936, which was described based on a single damaged male specimen collected on snow in spring at Takata, Niigata Prefecture. Antennal ratio (AR) of the original specimen is 2.84 according to Tokunaga (1936, p.531), and is much smaller than 3.38-4.26 (mean 3.73) in the present specimens. This species is characteristic in that segment II of palp is distinctly produced beyond insertion of segment III (Figs. 1-B, M) both in male and female, tarsi IV is cylindrical and longer than tarsi V in all legs, and tarsi III without apical spurs in all legs. The characters of front tarsi, as well as those of female are new records.

2. *Diamesa tsutsuii* TOKUNAGA, 1936

Diamesa tsutsuii; TOKUNAGA, 1936, p.546

Diamesa tsutsuii; TOKUNAGA, 1937, p.60

Diamesa tsutsuii; TOKUNAGA, 1964, p.22

Materials studied: 7 females belonging to this species were identified among the chironomids collected in March 1984 on the wall of buildings of our university.

Female: Body length 3.93-4.80 (4.42 in average of 7) mm, wing length 3.16-4.59 (mean 3.78) mm. Body coloration largely dark brown or nearly black; scutal stripes brownish black, area between the stripes pruinose, scutellum and postnotum black, wing slightly brown in transmitted light, halteres white, leg segments entirely dark brown; abdominal tergites dark brown and each with a narrow pale band along caudal margin. Head in Fig. 2-A. Eyes highly pubescent, reniform and with concave inner margin, ER 0.62-0.79 (mean 0.71). Antenna composed of a pedicel and 7 flagellar segments, last segment with 2 sub-apical setae, AR 0.36-0.40 (mean 0.38). Palp with 4 flagellar segments, segment III attached to apical end of segment II. Supraorbital setae distributed on frontal surface in multiple rows, 26-38 (mean 32.0) on both sides. Clypeal setae 12-16 (mean 14.7). Anteprepronotum without dorsal setae and with 18-28 (mean 23.1) lateral setae. Scutum without dorso-median setae, with 12-20 (mean 16.9) dorsolateral setae and 8-12 (mean 8.8) pre-alar setae on each side. Scutellar setae 36-56 (mean 46.4) distributed in multiple rows.

Wing in Fig. 2-B. R2+3 present and simple. Costa extending beyond end of R4+5. Cross vein m-cu present, and situated distal to fCu. Spermathecae two, both almost globular and

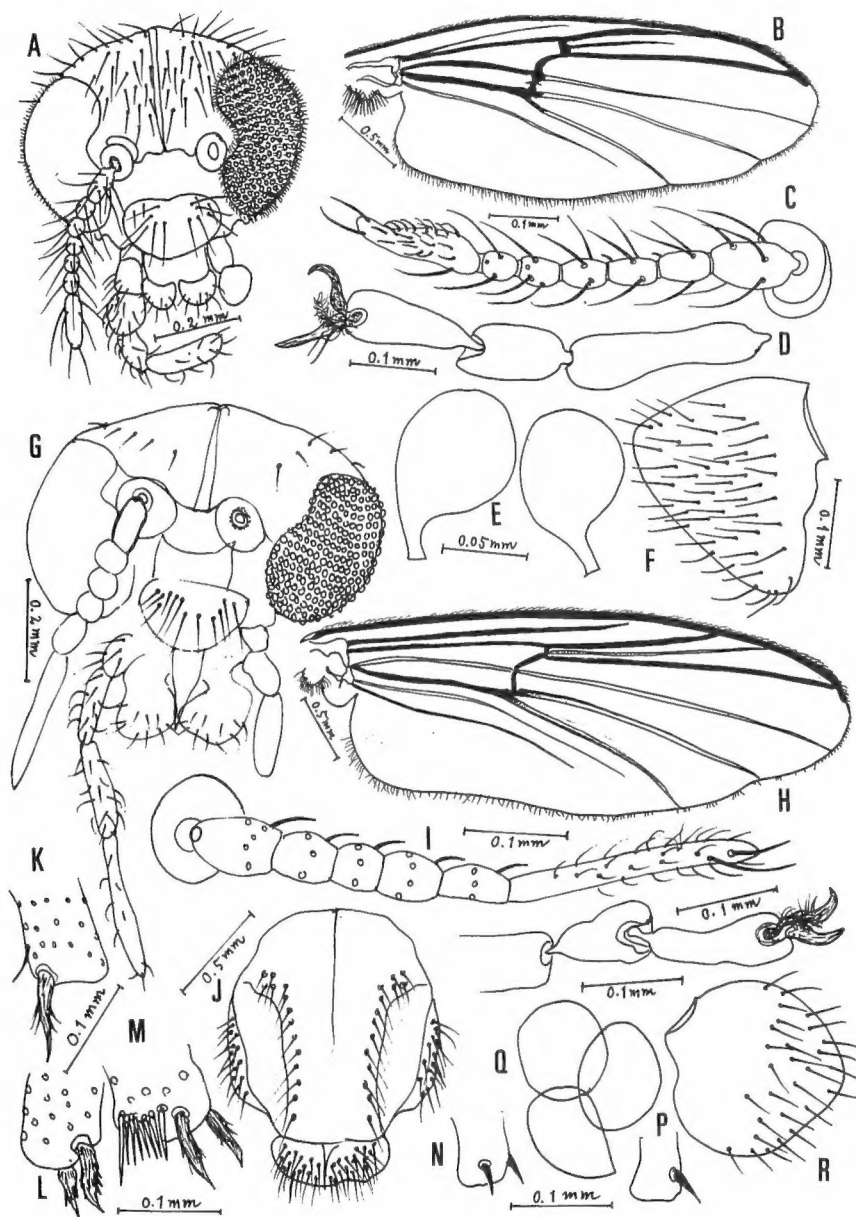


Fig. 2. *Diamesa tsutsui* TOKUNAGA. Female. A. head. B. wing. C. antenna. D. middle tarsus III, IV and V. E. spermathecae. F. cercus. *Psilodiamesa nigatana* TOKUNAGA. Female. G. head. H. wing. I. antenna. J. scutum and scutellum. K. tip of front tibia. L. tip of middle tibia. M. tip of hind tibia. N. tip of hind tarsus I. P. tip of hind tarsus II. Q. spermathecae. R. cercus.

darkly pigmented (Fig. 2-E). Cercus roughly triangular in shape (Fig. 2-F).

Remarks: The present species was collected so far only by female, and is morphologically coincident with the female of *Diamesa tsutsuii* of TOKUNAGA (1936), which was collected on the snow at Hosono, Nagano Prefecture, in March 1935. The present species is similar in body coloration and wing venation to the previous species, but can be easily differentiated in female by the number of flagellar segments of antenna (7 in the present, 6 in the former), antennal ratio (smaller in the present species), in the number of spermathecae, and in the shape of cercus.

3. *Psilodiamesa nigatana* (TOKUNAGA, 1936)

Diamesa (Psilodiamesa) nigatana; TOKUNAGA, 1936, p.537

Diamesa (Psilodiamesa) nigatana; TOKUNAGA, 1937, p.55

Materials studied: A female was found among the specimens collected with sucking tube on walls of Fukuju Pharmaceutical Co. on the bank of Kumano River, Toyama-shi. (No. A. 97:56).

Female: Body length 4.04 mm, wing length 3.28 mm. Body coloration almost uniformly black. Head in Fig. 2-G. Eyes bare, reniform and without dorsomedial projection, ER 1.20. Antenna with a pedicel and 6 flagellar segments. Palp with 4 flagellar segments. Supraorbital setae 10 on each side, clypeal setae 14. Anteprepronotum with 6 lateral setae on both sides. Scutum and scutellum in Fig. 2-J. Dorsomedian setae none, dorsolateral setae 14 on each side, pre-alar also 14 on each side. Scutellum with 34 setae in roughly triple rows. Wing in Fig. 2-H. Squama with 64, 68 fringe hairs. Costa extending beyond end of R4+5. Cross vein m-cu connected with Cul and distal of fCu. LR1 0.72, LR2 0.58, LR3 0.57, the latter unusually small. Front tarsus V 0.11 times as long as front tibia. BR1 1.5, BR2 2.0, BR3 2.7. Front tibia with a long terminal spur (68 microns; Fig. 2-K), middle tibia with two short terminal spurs (28, 30 microns; Fig. 2-L), hind tibia with two terminal spurs (58 and 64 microns), and a terminal comb composed of 10 free spurs 40-70 microns in length (Fig. 2-M). Tarsi I and II of middle and hind legs with one or two terminal spurs (Figs. 2-N, P). Spermathecae 3 (Fig. 2-Q), cercus in Fig. 2-R.

Remarks: This species is a member of the genus *Psilodiamesa* of the subfamily Diamesinae, since cross vein m-cu present and situated distal to fCu, dorsolateral setae of scutum well developed and arising from large pale pits, eyes are bare (pubescent in genus *Diamesa*), and tarsi IV of all legs are bilobed at the tip and shorter than tarsi V. This specimen is tentatively identified as the female of *P. nigatana* (TOKUNAGA), which was described based on a single male collected at Sasagamine, Niigata Prefecture, because of the similarity in the basic structure.

4. *Prodiamesa nagaii* SASA et KAWAI, sp. nov.

Materials studied : 19 males and a female were found among the adult specimens collected with insect net on the bank of Kumano River, Toyama, on 31 March 1983. 11 males and a female were dissected and mounted for morphological study (Specimen No. A97:51-58).

Male: Body length 4.80-5.77 (5.10 in average of 10) mm, wing length 3.16-3.37 (mean 3.27) mm. Body almost entirely black or dark brown, *i. e.* antennal hairs brown, shaft dark brown; scutal stripes pruinose black, the area between median and lateral stripes shining black, scutellum and postnotum black; abdominal tergites dark brown and each with a narrow pale band along caudal margin; halteres brown, leg segments all dark brown; wing unmarked, dark brown around cross veins r-m and m-cu. Head in Fig. 3-A. Eyes bare, each with a long and narrow dorsomedial projection, ER relatively small, 0.58-0.84 (mean 0.67). Antenna with 13 flagellar segments, AR 2.05-2.31 (mean 2.20). Antennal hairs very long, AHR 0.62-0.74 (mean 0.66). Supraorbital setae 10-13 (mean 11.5) on one side, clypeal setae 12-18 (mean 13.8). Palp with 4 flagellar segments, base of each segment connected to the tip of the preceding segment, as usual. Anteprepronotum with 6-10 (most frequently 8, mean 7.9) lateral setae. Scutum without dorsomedian setae, with 19-32 (mean 24.2) dorsolateral setae, and 6-12 (mean 7.6) pre-alar setae. Scutellar setae 26-38 (mean 30.9) roughly in 3 transverse rows. Wing in Fig. 3-B. Spuama with 20-41 (mean 29.3) fringe hairs. Wing membrane finely dotted with microtrichiae. Costa extending beyond end of R4+5. R2+3 simple, and separated from R1 and R4+5, ending about midway between ends of the two veins. Cross vein m-cu present, and situated proximal to fCu and r-m (characteristic to this genus). Anal vein extending much beyond fCu. Anal lobe only moderately produced, nearly rectangular. Tip of front tibia with a long spur (85 microns; Fig. 3-C), tip of middle tibia with two short spurs both 40 microns long (Fig. 3-D), tip of hind tibia (Fig. 3-E) with a long spur (72 microns), a short spur (45 microns), and a terminal comb composed of 15 free and curved spurs 32-70 microns in length. Tarsi I and II of middle and hind legs all with two short terminal spurs (Fig. 3-F, G), but other leg segments without terminal spurs. LRI large, 0.82-0.87 (mean 0.84), LR2 0.48-0.55 (mean 0.52), LR3 0.53-0.59 (mean 0.56). Front tarsus V 0.14-0.16 times as long as front tibia. Tarsi with relatively long beards, BR1 2.8-4.9 (mean 3.9), BR2 2.2-4.7 (mean 3.0), LR3 3.0-4.3 (mean 3.7). All legs with a pair of claws with basal hairs and forked tip, and a well developed empodium, but pulvilli are absent.

Hypopygium in Figs. 3-H, I, J. Ninth tergite with rather flat and rounded posterior margin, with transverse rows of 38-54 short setae in the middle, anal point absent. Gonocoxite with a darkly chitinized simple blade arising from an elevated base (Fig. 3-J-a), a low dorsal lobe bearing several stout setae (-b), and a large, tongue-like ventral process bearing numerous microtrichiae and short setae (-c). Gonostylus widest near base, with a large subterminal blade (Fig. 3-J-d).

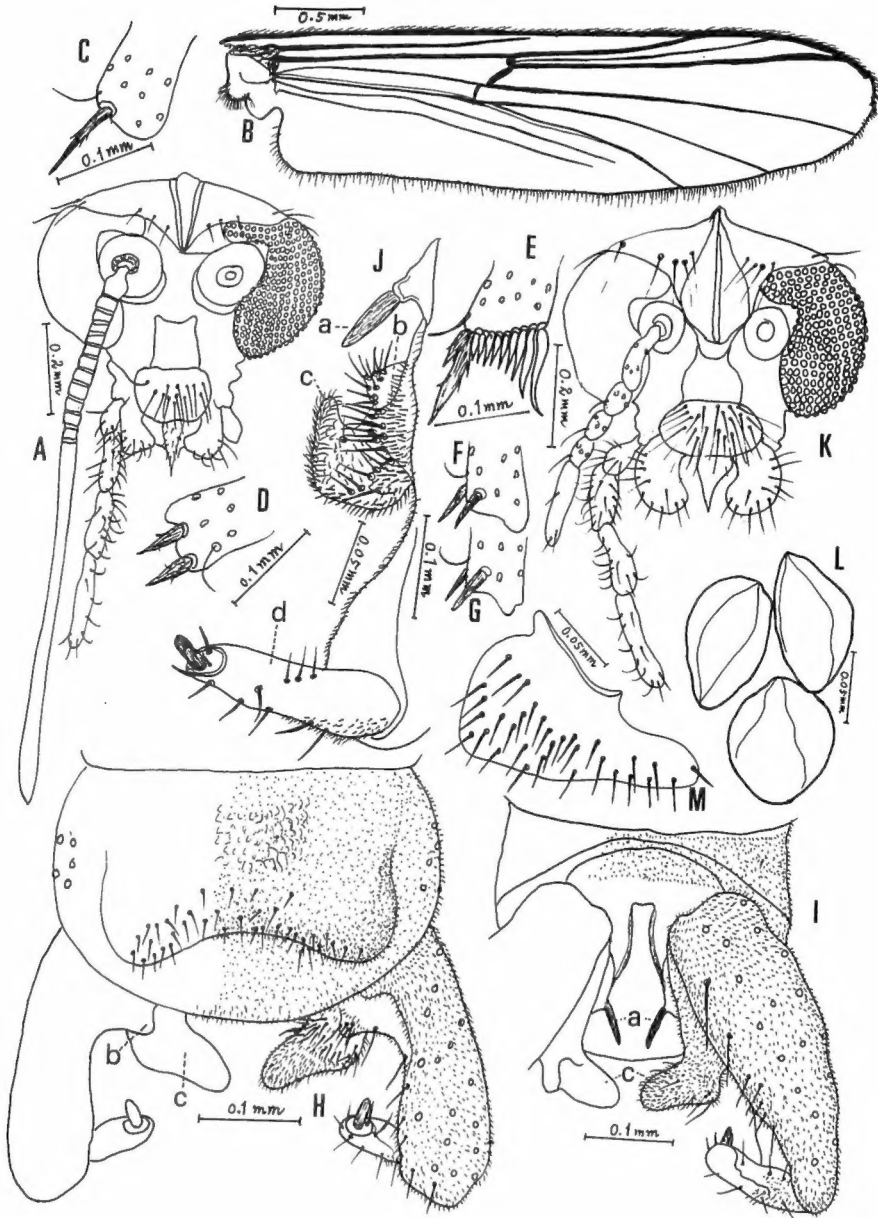


Fig. 3. *Prodiamesa nagaii*, sp. nov. Male. A. head. B. wing. C. tip of front tibia. D. tip of middle tibia. E. tip of hind tibia. F. tip of hind tarsus I. G. tip of hind tarsus II. H. hypopygium, dorsal view. I. hypopygium, ventral view. J. inner margin of gonocoxite, and gonostylus; a. basal process, b. dorsal lobe, c. ventral lobe, d. gonostylus. Female. K. head. L. spermathecae. M. cercus.

Female : A single specimen examined is, body length 4.54mm, wing length 3.27mm. Coloration as in male. Head in Fig. 3-K. Eyes bare, with conspicuous dorsomedial projection, ER 0.62. Antenna composed of a pedicel, and 5 flagellar segments, 112, 72, 72, 72, 176 microns. Supraorbital setae 8 on both sides, clypeal setae 20. Palp with 4 flagellar segments as usual. Anteprepronotum with 6 and 8 lateral setae. Scutum without dorsomedian setae as in male, with 26 and 26 dorsolateral setae, and 10, 10 pre-alar setae. Scutellar setae 42. Wing venation as in male. Squama with 30 fringe hairs. LR1 0.77, LR2 0.47, LR3 0.55. Tarsus V 0.15 times as long as tibia in front leg. Tarsal hairs relatively short, BR1 2.1, BR2 1.8, BR3 2.0. Spermathecae 3, as in Fig. 3-L. Cercus ear-shaped (Fig. 3-M).

Remarks : This species is a member of genus *Prodiamesa* KIEFFER of the subfamily Prodiamesinae, since wing vein R2+3 present and simple, cross vein m-cu present and proximal to fCu, penultimate segment of maxillary palp not toothed, and base of gonocoxite of male hypopygium bearing darkly chitinized elongate blade arising from a swelling base. Two species of this subfamily were recorded by Tokunaga (1936), *P. bathyphila* KIEFFER and *P. brevitarsis* TOKUNAGA, but both belong to genus *Monodiamesa* which has no darkly chitinized blade on the base of gonocoxite, the former bearing anal point, and the latter with bilobed tarsi IV. The present species also differs from the two species of this genus recorded from Europe, from *P. olivaces* (MEIGEN) in that gonostylus being simple, and from *P. rufovittata* GOETGHEBUER in that anal point is adsent.

The name of this new species is dedicated to Dr. Shinryu Nagai, Director, Toyama Science Museum.

5. *Orthocladus suspensus* (TOKUNAGA, 1939)

Spaniotoma (Orthocladus) suspensa ; TOKUNAGA, 1939, p.323

Orthocladus (sen. str.) *suspensus* ; TOKUNAGA, 1964, p.17

Spaniotoma (Orthocladus) suspensa ; TOKUNAGA, 1973, p.642

Materials studied : Large numbers of both males and females were collected during the winter season from early January to late March 1983 on the snow outside of university buildings, and also on the bank of River Kumano. 10 males and 10 females among them were mounted for morphological studies (Specimens No. A 97 : 11-38).

Male : Body length 4.39-5.41 (4.88 in average of 10) mm, wing length 3.18-3.69 (mean 3.41) mm. Body almost entirely black, halteres white. Antenna with 13 flagellar segments, AR relatively high, 2.73-3.23 (mean 2.84), AHR 0.55-0.79 (mean 0.66). Eyes bare, dorsomedial projection conspicuous, ER 0.88-1.03 (mean 0.98). Anteprepronotum without dorsal setae and with 8-15 lateral setae on each side. Supraorbital setae 12-21 (mean 15.8) on each side, clypeal setae 16-23 (mean 17.9). Scutum with 6-10 (mean 7.4) short dorsomedian setae, 8-15 (mean 10.0) long dorsolateral setae arising from pale pits, pre-alar setae 4-6 (mean 5.1), scutellar setae 16-24

(mean 19.0) roughly in two rows (Fig. 4-E). Front tibia with a long terminal spur, middle tibia with two short terminal spurs, hind tibia with a long terminal spur, a short terminal spur, and a row of free spurs, tarsi I and II of middle and hind legs each with two short terminal spurs. LR1 relatively high, 0.79-0.85 (mean 0.82), LR2 0.55-0.59 (0.57), LR3 0.60-0.63 (0.61). Front tarsus V 0.13-0.15 (mean 0.14) times as long as front tibia. Tarsal beards relatively long, BR1 2.9-5.2 (3.2), BR2 3.2-5.3 (3.9), BR3 4.5-6.2 (mean 5.5). Claws long and stout, apically forked and with several basal hairs, empodium short, pulvilli very small (Fig. 4-F). Wing bare, slightly brown, squama with 27-44 (mean 32.4) fringe hairs, anal lobe strongly produced. Costa only slightly produced beyond end of R4+5, fCu slightly beyond r-m, anal vein extending much beyond fCu, indicating that this species belongs to Group C of *Orthocladius* of Edwards (1929, p.336).

Hypopygium in Fig. 4-G. Anal point triangular, apically pointed and with several lateral setae. Inner lobes of gonocoxite double, the dorsal lobe being narrow and finger-like. Gonostylus truncate apically and with a conspicuous subapical swelling on apical half of inner surface.

Female: Body length 3.01-4.49 (3.98 in average of 9) mm, wing length 2.76-3.88 (mean 3.42) mm. Body almost uniformly black as in male, halteres white. Head in Fig. 4-A. Eyes bare, ER 1.00-1.21 (mean 1.09). Antenna with 5 flagellar segments, last segment 0.73-1.00 (mean 0.820 ± 0.078) last segment without long subapical hair (Fig. 4-B). Supraorbital setae 8-16 (mean 12.5), clypeal setae 16-32 (mean 23.7). Anteprepronotum with 6-12 (mean 8.7) lateral setae. Dorsomedian setae 8-12 (mean 11.0), all minute, dorsolateral setae 8-22 (mean 12.4), pre-alar setae 4-6 (mean 5.0). Scutellar setae 20-36 (mean 27.3). Squama with 26-42 (mean 32.8) fringe hairs. LR1 0.76-0.80 (mean 0.77), LR2 0.52-0.56 (mean 0.54), LR3 0.57-0.61 (mean 0.59). Front tarsus V 0.12-0.14 (mean 0.13) times the length of front tibia. BR1 2.0-2.9 (mean 2.4), BR2 2.0-2.6 (mean 2.3), BR3 2.2-3.5 (mean 2.8).

Remarks: This species is tentatively designated as *Orthocladius suspensus* (TOKUNAGA, 1939), because morphology of the male is coincident with the description of this species given by Tokunaga (1964) for a snow midge collected in Niigata and Yamagata under the similar environment. Further morphological and ecological information is needed for the definitive identification.

6. *Orthocladius kanii* (TOKUNAGA, 1939)

Spaniotoma (Orthocladius) kanii; TOKUNAGA, 1939, p.315

Orthocladius (sen. str.) *kanii*; TOKUNAGA, 1964, p.17

Spaniotoma (Orthocladius) kanii; TOKUNAGA, 1973, p.641

Orthocladius (Euorthocladius) kanii; SASA, 1979, p.26

Materials studied: Large numbers of males and females were collected during the winter season from early January to late March in 1983 and 1984 in our university campus and on the bank of River Kumano, Toyama City. 10 males and 9 females among them were mounted

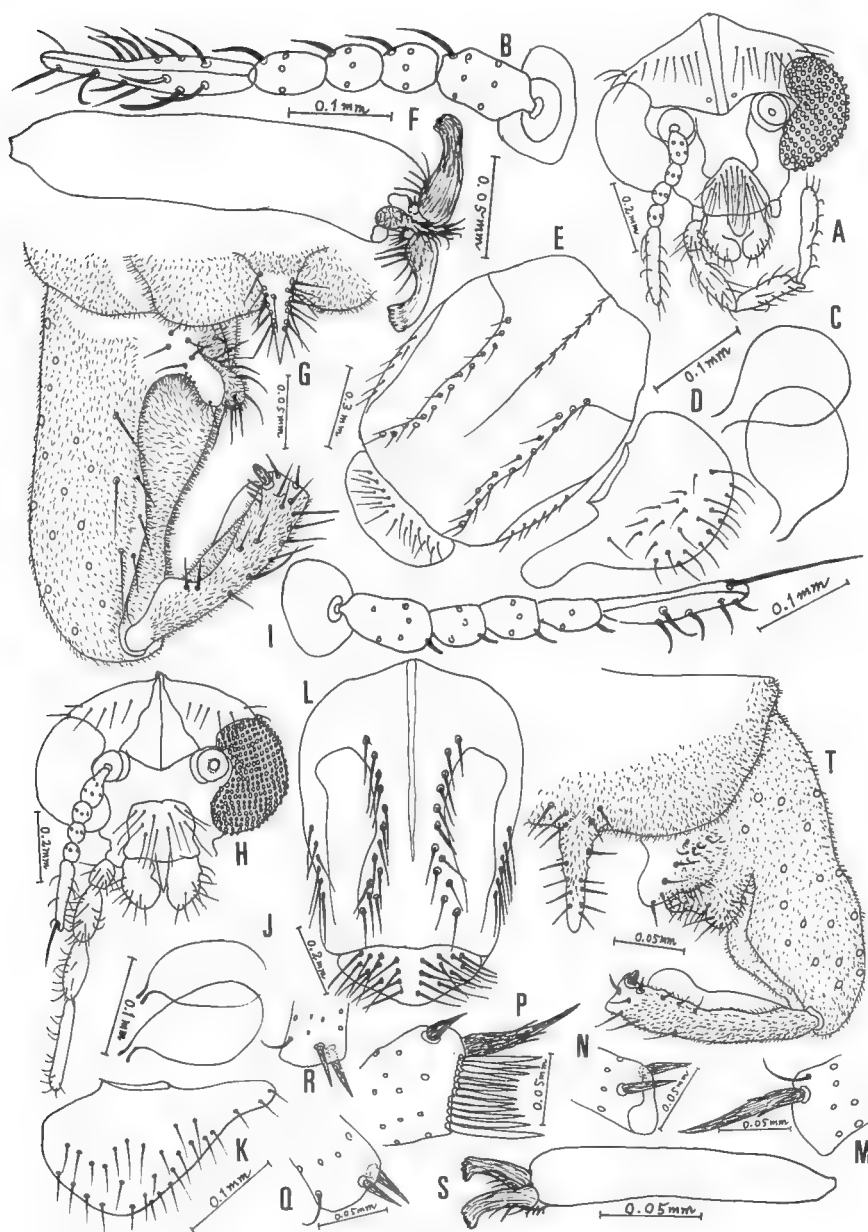


Fig. 4. *Orthocladius suspensus* (TOKUNAGA). Female. A. head. B. antenna. C. spermathecae. D. cercus. Male. E. scutum and scutellum. F. middle tarsus V. G. hypopygium. *Orthocladius kanii* (TOKUNAGA, 1939). Female. H. head. I. antenna. J. spermathecae. K. cercus. Male. L. scutum and scutellum. M. tip of front tibia. N. tip of middle tibia. P. tip of hind tibia. Q. tip of hind tarsus I. R. tip of hind tarsus II. S. middle tarsus V. T. hypopygium.

on slides for morphological study (No. A 97:21-39).

Male: Body length 3.23-3.54 (3.34 in average of 10) mm, wing length 2.37-2.65 (mean 2.48) mm, both significantly smaller than in the preceding species. Antenna with 13 flagellar segments, AR 1.47-1.83 (mean 1.66 ± 0.11), also significantly smaller than in the preceding species. AHR 0.54-0.74 (mean 0.60). Eyes bare, only slightly projected dorsomedially, ER 1.06-1.35 (mean 1.15). Supraorbital setae 12-16 (mean 14.6) on each side, clypeal setae 8-16 (mean 12.4). Anteprenotum with 4-8 (mean 4.8) lateral setae. Scutum without dorsomedian setae (a differentiating point from *O. suspensus*), with 9-12 (mean 10.2) dorsolateral setae and 4-6 (mean 4.6) pre-alar setae on each side; scutellar setae 16-28 in double or triple rows (Fig. 4-L). Wing membrane smooth and slightly brown by transmitted light, fCu slightly beyond r-m, cross vein m-cu absent, anal vein extending much beyond fCu, anal lobe conspicuously produced, squama with 20-31 (mean 26.5) fringe hairs. Structure of terminal spurs of tibiae and tarsi as in the preceding species, as shown in Figs. 4-M, N, P, Q, R. LR1 0.77-0.79 (mean 0.78), LR2 0.53-0.57 (mean 0.55), LR3 0.58-0.62 (mean 0.59). Tarsus V of front leg 0.15-0.16 times as long as front tibia. Tarsal beards relatively long, BR1 2.4-4.4 (mean 3.1), BR2 3.3-5.3 (mean 4.2), BR3 3.8-7.3 (mean 5.4). Claws well developed, apically forked, but pulvilli absent and empodium vestigial (Fig. 4-S).

Hypopygium in Fig. 4-T. Anal point nearly parallel-sided, with rounded apex and several lateral setae. Inner lobe of gonocoxite double, both wider than in the preceding species. Gonostylus with subapical swelling.

Female: Body length 2.65-3.32 (2.90 in average of 9) mm, wing length 2.09-2.91 (mean 2.60) mm, both significantly smaller than female of the preceding species, though the ranges of variation being overlapping with each other. Head in Fig. 4-H. Antenna with 5 flagellar segments as in the preceding species, but AR 0.52-0.63 (mean 0.567 ± 0.035) and significantly smaller; last segment with one (rarely two) long subapical seta which is absent in the former species. Eyes bare, reniform, ER 0.95-1.09 (mean 1.02). Supraorbital setae 8-12 (mean 9.8) on each side, clypeal setae 11-20 (mean 15.3). Anteprenotum with 6-8 (mean 7.2) lateral setae. Dorsomedian setae absent (a differentiating character from the preceding species). Dorsolateral setae 8-12 (mean 9.8), pre-alar setae 4-6 (mean 5.0). Scutellum with 20-38 (mean 23.1) setae in multiple rows. LR1 0.70-0.77 (mean 0.74), LR2 0.50-0.56 (mean 0.53), LR3 0.57-0.58. Front tarsus V 0.14-0.16 (mean 0.15) times as long as front tibia. Tarsal beards much shorter than in male, BR1 1.8-2.5 (mean 2.2), BR2 2.0-2.8 (mean 2.4), BR3 2.4-4.0 (mean 3.1). Cercus ear-shaped (Fig. 4-K). Spermathecae two, both roughly globular (Fig. 4-J).

Remarks: The present species is a typical member of subgenus *Euorthocladus* in the sense of Brundin (1956) since scutellar setae are numerous and distributed in multiple rows, and anal point is roughly parallel-sided and with rounded apex. It is provisionally identified as *O. kanii* because the male is morphologically almost identical with the descriptions of Tokunaga (1939). This was also reported by Tokunaga (1964) as a snow midge collected at

Nagaoka, Niigata Prefecture. This species can be differentiated from the preceding species by the absence of dorsomedian scutellar setae and smaller body size, by the shape of anal point in male, and by the difference in antennal ratio and the presence of subapical antennal seta in female. However, this species should be highly characteristic in the structure of pupa, as pointed out by Sasa (1979), and thus further studies in immature stages are required in order to confirm the scientific name of the present specimens.

7. *Tanytarsus konishii* SASA et KAWAI, sp. nov.

Materials studied: Two males were collected by sweeping bushes with insect net on the shore of Kameike, Toyama-shi, 23 Nov. 1984 (Holotype: No. A 98:41a; paratype: A 98:41b).

Male: Body length 4.03, 4.08 mm, wing length 2.55, 2.60 mm, comparatively large as a member of *Tanytarsus*. Antennal hairs grey, shaft brown; ground color of scutum dark brown, stripes black, scutellum dark brown, postnotum black; wing unmarked, halteres white; leg segments almost uniformly brown, femore somewhat greenish; abdominal tergites greenish brown, hypopygium dark brown. Head in Fig. 5-C. Frontal tubercles large, cylindrical, 68 microns long, 18 microns in diameter, and 80 microns apart from each other (Fig. 5-D). Eyes bare, roughly crescent-shaped, ER 0.76, 0.74. Antenna with 13 flagellar segments as usual, AR 1.50, 1.56. Antennal hairs long, AHR 0.57, 0.59. Palp long, with 4 flagellar segments (53, 170, 165, 250 microns in length). Supraorbital setae 14, 14 and 16, 16, clypeal setae 18 or 14. Anteprepronotum (Fig. 5-A) without lateral setae. Scutum with 14 or 12 dorsomedian setae, 10, 10 or 14, 13 dorsolateral setae, and 2, 2, or 1, 2 pre-alar setae (Fig. 5-E). Scutellar setae 8 or 6. Wing in Fig. 5-B. Squama bare. Wing membrane with macrotrichiae, distributed rather sparsely and mainly on the distal half of the wing. Terminal scale of front tibia short, narrow and sharply pointed (Fig. 5-F). Terminal combs of middle and hind tibiae both narrow and each with a short spur (Fig. 5-H). LR1 2.00, 1.97, LR2 0.71, 0.68, LR3 0.70, 0.68. Tarsus V of front leg 0.29 times as long as front tibia in both specimens. Tarsi I of all legs with long beards, BR1 5.2, 4.5, BR2 5.7, 8.4, BR3 7.8, 6.1. Pulvilli about half as long as claws (Fig. 5-G).

Hypopygium in Fig. 5-I. Anal point (Fig. 5-K) roughly conical but with rounded apex, without microtrichiae excepting at base, with a pair of lateral ridges, 6 spine clusters between them in a single row, and several short lateral setae. Bands of ninth tergite separated in the middle and contiguous to the lateral ridges of anal point. Appendage 1 (Fig. 5-L) roughly kidney-shaped but abruptly narrowed in the caudal portion, with a short and 2 longer setae on the inner margin, 3 curved setae on dorsal surface, and 2 curved setae on lateral margin. Appendage 1-a absent. Appendage 2 expanded and curved inwards apically, with 16 recurved setae on dorsal side and 5 curved setae on posterior margin; appendage 2-a long, bearing numerous long and simple setae which reach to near apex of appendage 2 (Fig. 5-J). Gonostylus widest at about middle, inner margin slightly concave, outer margin smoothly convex.

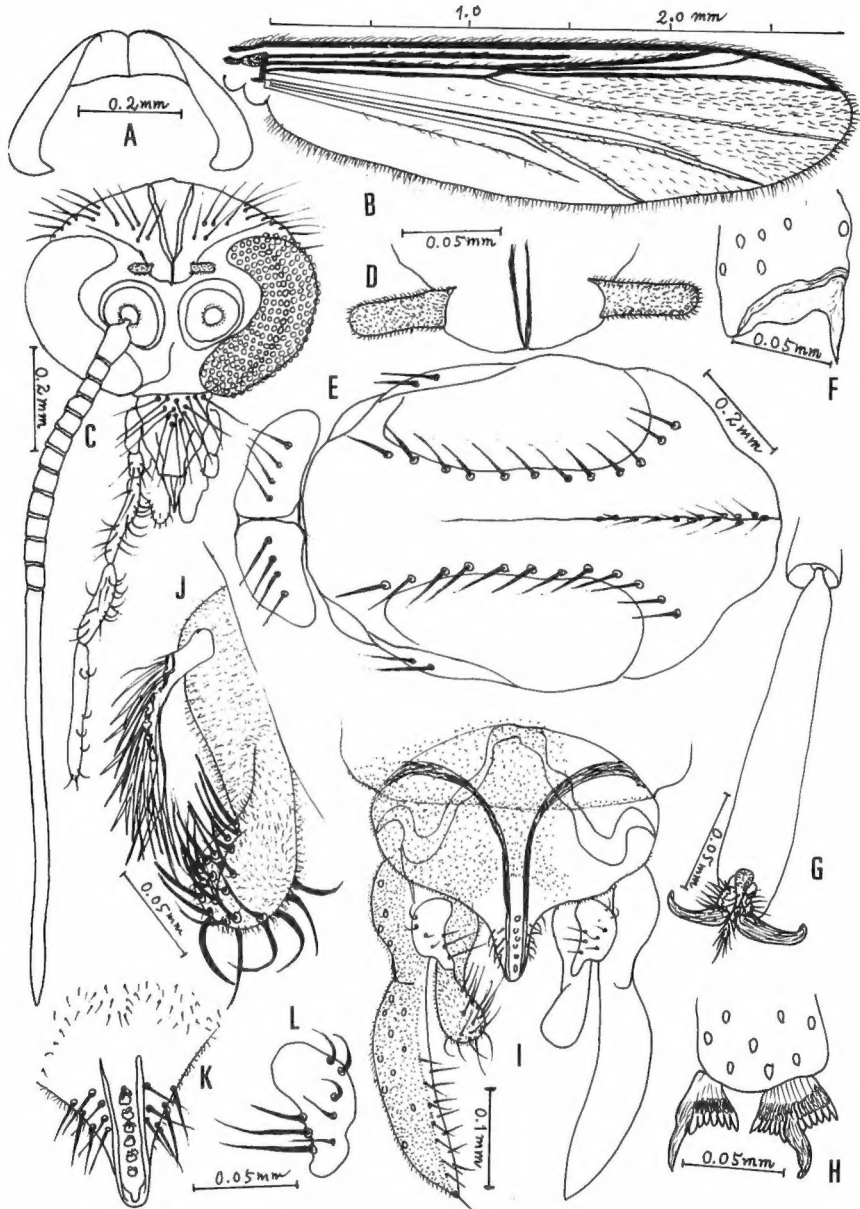


Fig. 5. *Tanytarsus konishii*, sp. nov. Male. A. antepnotum. B. wing. C. head. D. frontal tubercles. E. scutum and scutellum. F. tip of front tibia. G. middle tarsus V. H. tip of hind tibia. I. hypopygium, dorsal view. J. appendages 2 and 2-a. K. anal point. L. dorsal appendage.

Remarks: The specimens of this new species were collected from bush on the shore of Kameike Pond together with adults of 19 males and 6 females of *Smittia aterrima* (MEIGEN) and 11 males and 2 females of *Smittia nudipennis* (GOETGHEBUER). They are morphologically most closely related to *Tanytarsus gregarius* (KIEFFER, 1909) which is widely distributed in lakes of middle and northern Europe and described in details by Edwards (1929, p.411), Reiss & Fittkau (1971, p.114) and Pinder (1978, p. 156), but both differ in body coloration (generally pale green and scutal stripes light to dark brownish in *gregarius*), appendage 2-a shorter and with flattened hairs, appendage 2 not apically swollen, and bands of ninth tergite ending free, not connected to lateral ridges of anal point, in *gregarius*). Among the species previously recorded from Japan, the present one resembles somewhat to *T. tamaseptimus* SASA, 1980 (p.22) in that spine clusters on anal point are less than 8 in number, appendage 1-a absent, and appendage 2-a being long and slender, but both differ essentially in body coloration (yellow in *tamaseptimus*), in the number of antennal segments (only 10 in *tamaseptimus*), in AR (only 0.7 in *tamaseptimus*), etc. The name of this new species is dedicated to Professor K. Konishi, Department of Bacteriology and Immunology, Toyama Medical and Pharmaceutical University.

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